

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1-44. (Canceled).

45. (Currently amended) A process for producing tires, comprising:
sequentially producing incomplete tire structures in at least one assembly
line;

temporarily storing the incomplete tire structures in a storage station
configured to store a plurality of the incomplete tire structures;

transferring the incomplete tire structures to at least one completion
station;

in the at least one completion station, forming at least one constituent tire
element on each incomplete tire structure and preparing the incomplete tire structures
for vulcanization; and

subjecting completed tire structures to vulcanization;

wherein sequentially producing the incomplete tire structures comprises:

building a carcass structure in a form of a substantially cylindrical
sleeve; and

shaping the carcass structure so as to have a substantially toroidal
shape;

wherein the carcass structure comprises at least one carcass ply
operationally associated with annular reinforcing structures,

wherein the annular reinforcing structures are axially spaced apart from each other, and

wherein forming the at least one constituent tire element comprises laying down at least one continuous long element of elastomer material ~~along a predetermined path~~ in partially superimposed circumferential turns around an axis of the incomplete tire structure,

wherein the storing of the incomplete tire structures is able to absorb the production of the assembly line when the latter is operative and supply the completion station even when the assembly line is at a standstill,

wherein the completion station comprises at least two handling units configured to access the incomplete tire structures stored in the storage station.

46. (Previously presented) The process of claim 45, wherein at least two incomplete tire structures are processed simultaneously in a same completion station.

47. (Previously presented) The process of claim 45, wherein at least two incomplete tire structures are subjected simultaneously to forming the at least one constituent tire element on each incomplete tire structure in a same completion station.

48. (Previously presented) The process of claim 45, wherein sequentially producing the incomplete tire structures further comprises:

manufacturing a belt structure; and

associating the belt structure with the carcass structure.

49. (Previously presented) The process of claim 48, wherein associating the belt structure with the carcass structure is performed before shaping the carcass structure so as to have the substantially toroidal shape.

50. (Previously presented) The process of claim 48, wherein associating the belt structure with the carcass structure is performed after shaping the carcass structure so as to have the substantially toroidal shape.

51. (Previously presented) The process of claim 48, wherein associating the belt structure with the carcass structure is performed at a same time as shaping the carcass structure so as to have the substantially toroidal shape.

52. (Previously presented) The process of claim 45, wherein building the carcass structure is performed on a building drum, and
wherein shaping the carcass structure is performed on a shaping drum.

53. (Previously presented) The process of claim 52, wherein before temporarily storing the incomplete tire structures, the incomplete tire structures are disengaged from the shaping drum.

54. (Previously presented) The process of claim 45, wherein building the carcass structure and shaping the carcass structure are both performed on a same building and shaping drum.

55. (Previously presented) The process of claim 54, wherein before temporarily storing the incomplete tire structures, the incomplete tire structures are disengaged from the building and shaping drum.

56. (Previously presented) The process of claim 45, wherein temporarily storing the incomplete tire structures is performed in a storage station.

57. (Previously presented) The process of claim 45, wherein during forming the at least one constituent tire element, each incomplete tire structure is supported on a respective support member.

58. (Previously presented) The process of claim 57, wherein the respective support member comprises a shaping drum or a building and shaping drum.

59. (Canceled).

60. (Canceled).

61. (Previously presented) The process of claim 45, wherein the at least one constituent tire element comprises one or more of sidewalls, a tread band, a tread band underlayer, and an anti-abrasive strip or strips.

62. (Previously presented) The process of claim 45, wherein the at least one constituent tire element comprises sidewalls and a tread band.

63. (Previously presented) The process of claim 45, wherein the at least one constituent tire element comprises sidewalls, a tread band, and a tread band underlayer.

64. (Previously presented) The process of claim 45, wherein during forming the at least one constituent tire element, each incomplete tire structure is moved inside the at least one completion station using a rotational movement about at least one axis of the incomplete tire structure and a translatory movement with respect to at least one supplying member of the at least one long element.

65. (Previously presented) The process of claim 45, wherein after forming the at least one constituent tire element unvulcanized tire structures are disengaged from a support member and temporarily stored before subjecting the unvulcanized tire structures to vulcanization.

66. (Previously presented) The process of claim 45, wherein the incomplete tire structures supplied from an assembly line are transferred to at least two completion stations.

67. (Previously presented) The process of claim 45, wherein batches of incomplete tire structures supplied from at least two assembly lines are transferred to one completion station.

68. (Currently amended) A plant for producing tires, comprising:
at least one assembly line for producing incomplete tire structures;

at least one storage station for temporarily storing a plurality of the incomplete tire structures; and

at least one completion station for preparing the incomplete tire structures for vulcanization;

wherein the at least one assembly line comprises:

at least one apparatus for building carcass structures in a form of a substantially cylindrical sleeve; and

at least one apparatus for shaping the carcass structures so as to have a substantially toroidal shape;

wherein the carcass structures each comprise at least one carcass ply operationally associated with annular reinforcing structures,

wherein the annular reinforcing structures are axially spaced apart from each other,

wherein the at least one completion station comprises:

at least one member for supplying at least one continuous long element of elastomer material; and

at least two units for handling the incomplete tire structures from the at least one assembly line; and

wherein the handling units are able to impart to the incomplete tire structures a rotational movement about at least one axis of respective incomplete tire structures and a translatory movement with respect to the at least one supplying members, so as to form on the respective incomplete tire structures at least one constituent tire element by laying down the at least one long element ~~along a~~

predetermined path in partially superimposed circumferential turns around an axis of the incomplete tire structure,

wherein the storage station is able to absorb the production of the assembly line when the latter is operative and supply the completion station even when the assembly line is at a standstill,

wherein the handling units are each configured to access the storage station.

69. (Previously presented) The plant of claim 68, wherein the at least one apparatus for building the carcass structures comprises a building drum.

70. (Previously presented) The plant of claim 68, wherein the at least one apparatus for shaping the carcass structures comprises a shaping drum.

71. (Previously presented) The plant of claim 68, wherein the at least one apparatus for building the carcass structures and the at least one apparatus for shaping the carcass structures are incorporated in a unistage drum.

72. (Previously presented) The plant of claim 68, wherein the at least one assembly line comprises at least one auxiliary drum for forming a belt structure.

73. (Previously presented) The plant of claim 72, wherein the at least one assembly line comprises at least one transfer member for transferring the belt structure into a position radially on the outside of a respective carcass structure.

74. (Previously presented) The plant of claim 68, further comprising:
an unloading station for completed tire structures from the at least one completion station.
75. (Previously presented) The plant of claim 68, wherein the at least one completion station comprises at least two supplying members.
76. (Previously presented) The plant of claim 75, wherein the at least two supplying members are arranged symmetrically with respect to a same vertical plane of symmetry.
77. (Previously presented) The plant of claim 76, wherein the at least two handling units are arranged symmetrically with respect to the vertical plane of symmetry.
78. (Previously presented) The plant of claim 75, wherein a first supplying member and a second supplying member are arranged so that respective long elements of elastomer material are supplied substantially at a same height.
79. (Previously presented) The plant of claim 78, wherein a third supplying member is arranged so that a respective long element of elastomer material is supplied at a height vertically greater than the substantially same height of the first and second supplying members.

80. (Previously presented) The plant of claim 68, wherein the at least one completion station comprises first, second, and third supplying members.

81. (Previously presented) The plant of claim 80, wherein the first supplying member and the second supplying member are arranged so that respective long elements of elastomer material are supplied substantially at a same height.

82. (Previously presented) The plant of claim 81, wherein the third supplying member is arranged so that a respective long element of elastomer material is supplied at a height vertically greater than the substantially same height of the first and second supplying members.

83. (Previously presented) The plant of claim 68, wherein at least two completion stations are associated with each assembly line.

84. (Previously presented) The plant of claim 68, wherein at least two assembly lines are associated with each completion station.

85. (Currently amended) A completion station, comprising:
a first supplying member for supplying a first long element of elastomer material;
a second supplying member for supplying a second long element of elastomer material, ~~the second supplying member being arranged so that the second long element is supplied at a height vertically greater than the first long element; and~~

at least two units for handling incomplete tire structures, the at least two supplying members being arranged symmetrically with respect to a same vertical plane of symmetry;

the at least two handling units being arranged symmetrically with respect to a vertical plane of symmetry and each configured to access a storage station capable of storing a plurality of the incomplete tire structures;

wherein the handling units are able to impart to the incomplete tire structures a rotational movement about at least one axis of respective incomplete tire structures and a translatory movement with respect to the supplying members, so as to form on the respective incomplete tire structures at least one constituent tire element by laying down at least one of the long elements along a predetermined path.

86. (Canceled).

87. (Previously presented) The completion station of claim 85, further comprising a third supplying member for supplying a third long element of elastomer material, wherein the first and third supplying members are arranged symmetrically with respect to a same vertical plane of symmetry.

88. (Canceled).

89. (Previously presented) The completion station of claim 87, wherein the first supplying member and the third supplying member are arranged so that respective long elements of elastomer material are supplied substantially at a same height.

90. (Canceled).

91. (Previously presented) The completion station of claim 85, further comprising:

a third supplying member.

92. (Canceled).

93. (Canceled).

94. (Withdrawn) A process for producing tires, comprising:
sequentially producing incomplete tire structures in at least one assembly
line;
temporarily storing the incomplete tire structures at a storage station;
transferring the incomplete tire structures to at least one completion
station;
in the at least one completion station, forming at least one constituent tire
element on each incomplete tire structure via a plurality of supplying members; and
subjecting completed tire structures to vulcanization;
wherein sequentially producing the incomplete tire structures comprises:
building a carcass structure in a form of a substantially cylindrical sleeve;
and
shaping the carcass structure so as to have a substantially toroidal shape;
wherein the carcass structure comprises at least one carcass ply
operationally associated with annular reinforcing structures,

wherein the annular reinforcing structures are axially spaced apart from each other,

wherein forming the at least one constituent tire element comprises laying down at least one continuous long element of elastomer material along a predetermined path,

wherein transferring the incomplete tire structures comprises removing the incomplete tire structures from the storage station via an automated arm comprising a support member configured to receive an incomplete tire structure, and reorienting the support member via the automated arm such that the support member is positioned relative to one of the plurality of supplying members for forming the at least one constituent tire element, and

wherein forming at least one constituent tire element comprises orienting the support member relative to a first one of the supplying members and forming a first constituent tire element, and re-orienting the support member relative to a second of the supplying members and forming a second constituent tire element.

95. (Withdrawn) The process of claim 94, wherein at least two incomplete tire structures are processed simultaneously in a same completion station.

96. (Withdrawn) The process of claim 94, wherein at least two incomplete tire structures are subjected simultaneously to forming the at least one constituent tire element on each incomplete tire structure in a same completion station.

97. (Withdrawn) The process of claim 94, wherein sequentially producing the incomplete tire structures further comprises:

manufacturing a belt structure; and
associating the belt structure with the carcass structure.

98. (Withdrawn) The process of claim 97, wherein associating the belt structure with the carcass structure is performed before shaping the carcass structure so as to have the substantially toroidal shape.

99. (Withdrawn) The process of claim 97, wherein associating the belt structure with the carcass structure is performed after shaping the carcass structure so as to have the substantially toroidal shape.

100. (Withdrawn) The process of claim 97, wherein associating the belt structure with the carcass structure is performed at a same time as shaping the carcass structure so as to have the substantially toroidal shape.

101. (Withdrawn) The process of claim 94, wherein building the carcass structure is performed on a building drum, and

wherein shaping the carcass structure is performed on a shaping drum.

102. (Withdrawn) The process of claim 101, wherein before temporarily storing the incomplete tire structures, the incomplete tire structures are disengaged from the shaping drum.

103. (Withdrawn) The process of claim 94, wherein building the carcass structure and shaping the carcass structure are both performed on a same building and shaping drum.

104. (Withdrawn) The process of claim 103, wherein before temporarily storing the incomplete tire structures, the incomplete tire structures are disengaged from the building and shaping drum.

105. (Withdrawn) The process of claim 94, wherein temporarily storing the incomplete tire structures is performed in a storage station.

106. (Withdrawn) The process of claim 94, wherein during forming the at least one constituent tire element, each incomplete tire structure is supported on a respective support member.

107. (Withdrawn) The process of claim 106, wherein the respective support member comprises a shaping drum or a building and shaping drum.

108. (Withdrawn) The process of claim 94, wherein forming the at least one constituent tire element comprises laying down the at least one long element in circumferential turns around an axis of the incomplete tire structure.

109. (Withdrawn) The process of claim 108, wherein the circumferential turns are partially superimposed.

110. (Withdrawn) The process of claim 94, wherein the at least one constituent tire element comprises one or more of sidewalls, a tread band, a tread band underlayer, and an anti-abrasive strip or strips.

111. (Withdrawn) The process of claim 94, wherein the at least one constituent tire element comprises sidewalls and a tread band.

112. (Withdrawn) The process of claim 94, wherein the at least one constituent tire element comprises sidewalls, a tread band, and a tread band underlayer.

113. (Withdrawn) The process of claim 94, wherein during forming the at least one constituent tire element, each incomplete tire structure is moved inside the at least one completion station using a rotational movement about at least one axis of the incomplete tire structure and a translatory movement with respect to at least one supplying member of the at least one long element.

114. (Withdrawn) The process of claim 94, wherein after forming the at least one constituent tire element, unvulcanized tire structures are disengaged from a support member and temporarily stored before subjecting the unvulcanized tire structures to vulcanization.

115. (Withdrawn) The process of claim 94, wherein the incomplete tire structures supplied from an assembly line are transferred to at least two completion stations.

116. (Withdrawn) The process of claim 94, wherein batches of incomplete tire structures supplied from at least two assembly lines are transferred to one completion station.

117. (Withdrawn) A plant for producing tires, comprising:

- at least one assembly line for producing incomplete tire structures;
- at least one storage station for temporarily storing the incomplete tire structures; and
- at least one completion station;

wherein the at least one assembly line comprises:

- at least one apparatus for building carcass structures in a form of a substantially cylindrical sleeve; and
- at least one apparatus for shaping the carcass structures so as to have a substantially toroidal shape;

wherein the carcass structures each comprise at least one carcass ply operationally associated with annular reinforcing structures,

wherein the annular reinforcing structures are axially spaced apart from each other,

wherein the at least one completion station comprises:

- a first member for supplying at least a first continuous long element of elastomer material;
- a second member for supplying at least a second continuous long element of elastomer material; and

a handling unit for transferring the incomplete tire structures from the at least one storage station to an orientation relative to the first member for supplying the first continuous long element of elastomer material and re-orienting the incomplete tire structure relative to the second member for supplying the second continuous long element of elastomer material; and

wherein the handling unit comprises a support member and an automated arm configured to impart to the incomplete tire structures a rotational movement about at least one axis of respective incomplete tire structures and a translatory movement with respect to the supplying members, so as to form on the respective incomplete tire structures at least two constituent tire elements by laying down the first and second long element along a predetermined path.

118. (Withdrawn) The plant of claim 117, wherein the at least one apparatus for building the carcass structures comprises a building drum.

119. (Withdrawn) The plant of claim 117 wherein the at least one apparatus for shaping the carcass structures comprises a shaping drum.

120. (Withdrawn) The plant of claim 117, wherein the at least one apparatus for building the carcass structures and the at least one apparatus for shaping the carcass structures are incorporated in a unistage drum.

121. (Withdrawn) The plant of claim 117, wherein the at least one assembly line comprises at least one auxiliary drum for forming a belt structure.

122. (Withdrawn) The plant of claim 121, wherein the at least one assembly line comprises at least one transfer member for transferring the belt structure into a position radially on the outside of a respective carcass structure.

123. (Withdrawn) The plant of claim 117, further comprising:
an unloading station for completed tire structures from the at least one completion station.

124. (Withdrawn) The plant of claim 117, wherein the at least one completion station comprises at least two supplying members.

125. (Withdrawn) The plant of claim 124, wherein the at least two supplying members are arranged symmetrically with respect to a same vertical plane of symmetry.

126. (Withdrawn) The plant of claim 125, wherein the at least two handling units are arranged symmetrically with respect to the vertical plane of symmetry.

127. (Withdrawn) The plant of claim 124, wherein a first supplying member and a second supplying member are arranged so that respective long elements of elastomer material are supplied substantially at a same height.

128. (Withdrawn) The plant of claim 127, wherein a third supplying member is arranged so that a respective long element of elastomer material is supplied at a height vertically greater than the substantially same height of the first and second supplying members.

129. (Withdrawn) The plant of claim 117, wherein the at least one completion station comprises first, second, and third supplying members.

130. (Withdrawn) The plant of claim 129, wherein the first supplying member and the second supplying member are arranged so that respective long elements of elastomer material are supplied substantially at a same height.

131. (Withdrawn) The plant of claim 130, wherein the third supplying member is arranged so that a respective long element of elastomer material is supplied at a height vertically greater than the substantially same height of the first and second supplying members.

132. (Withdrawn) The plant of claim 117, wherein at least two completion stations are associated with each assembly line.

133. (Withdrawn) The plant of claim 117, wherein at least two assembly lines are associated with each completion station.

134. (Withdrawn) A completion station, comprising:

- a first member for supplying at least a first continuous long element of elastomer material;
- a second member for supplying at least a second continuous long element of elastomer material; and
- a handling unit for transferring incomplete tire structures from a storage station to the completion station, such that the incomplete tire structure is positioned

relative to the first member for supplying the first continuous long element of elastomer material and re-positioned relative to the second member for supplying the second continuous long element of elastomer material;

wherein the handling unit comprises an automated arm and a support member configured to impart to the incomplete tire structures a rotational movement about at least one axis of respective incomplete tire structures via the support member and a translatory movement with respect to the supplying members via the automated arm, so as to form on the respective incomplete tire structures at least two constituent tire elements by laying down the first and second long elements along a predetermined path.

135. (Withdrawn) The completion station of claim 134, further comprising:
at least two supplying members.

136. (Withdrawn) The completion station of claim 135, wherein the at least two supplying members are arranged symmetrically with respect to a same vertical plane of symmetry.

137. (Withdrawn) The completion station of claim 136, wherein the at least two automated arms are arranged symmetrically with respect to the vertical plane of symmetry.

138. (Withdrawn) The completion station of claim 135, wherein a first supplying member and a second supplying member are arranged so that respective long elements of elastomer material are supplied substantially at a same height.

139. (Withdrawn) The completion station of claim 138, wherein a third supplying member is arranged so that a respective long element of elastomer material is supplied at a height vertically greater than the substantially same height of the first and second supplying members.

140. (Withdrawn) The completion station of claim 134, further comprising:
first, second, and third supplying members.

141. (Withdrawn) The completion station of claim 140, wherein the first supplying member and the second supplying member are arranged so that respective long elements of elastomer material are supplied substantially at a same height.

142. (Withdrawn) The completion station of claim 141, wherein the third supplying member is arranged so that a respective long element of elastomer material is supplied at a height vertically greater than the substantially same height of the first and second supplying members.